

ABSTRACT OF THE INVENTION

Apparatus and method for performing laser thermal annealing (LTA) of a substrate using an annealing radiation beam that is not substantially absorbed in the substrate at room temperature. The method takes advantage of the fact that the absorption of long wavelength radiation (1 micron or greater) in some substrates, such as undoped silicon substrates, is a strong function of temperature. The method includes heating the substrate to a critical temperature where the absorption of long-wavelength annealing radiation is substantial, and then irradiating the substrate with the annealing radiation to generate a temperature capable of annealing the substrate.